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09/535,836	03/28/2000	Hisashi Ohtani	SEL 173	5046

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EXAMINER

VU, HUNG K

ART UNIT PAPER NUMBER

2811

DATE MAILED: 05/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/535,836

Applicant(s)

OHTANI ET AL.

Examiner

Hung K. Vu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12, 19-24 and 28-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12, 19-24 and 28-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 28-31 and 40-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (PN 5,777,701, of record) in view of Tabara (PN 5,767,015, of record).

With regard to claims 28 and 40, Zhang discloses, as shown in Figure 1, a semiconductor device comprising,

a thin film transistor formed over a substrate (101), the thin film transistor having a semiconductor layer (104,106) and a gate layer electrode (110) adjacent to the semiconductor layer with a gate insulating film (109) interposed there between;

a first insulating film (112) formed over the thin film transistor;

a second conductive layer (115) formed on the first insulating layer;

a second insulating film (117) formed on the second conductive layer and the first insulating film;

a pixel electrode (118) formed on the second insulating film, the pixel electrode being connected to the second conductive layer at the bottom of a contact hole provided in the second insulating film;

wherein the second wiring layer is directly connected to the semiconductor layer through a contact hole provided in the first insulating film.

Zhang does not disclose a first conductive layer with a contact hole between the first insulating layer and the second conductive layer. However, Tabara discloses an aluminum layer (16) with a contact hole between a first insulating layer (14) and a second metallic layer (18A,20A). Note Col. 3, line 56, Col. 4, line 58 – Col. 5, line 10, and Figure 8A of Tabara. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form a first conductive layer with a contact hole between the first insulating layer and the second conductive layer of Zhang, such as taught by Tabara in order to have the contact hole with higher aspect ratio so that the number of processes can be reduced and the reliability of the interconnection can be improved. Note that it is inherent the combination of Zhang and Tabara references would disclose the second insulating film formed on the second conductive layer, the first conductive layer and the first insulating film. Also note that the word “on” does not necessary mean “in direct contact with” or “in physical contact with”.

With regard to claims 29 and 41, Zhang and Tabara disclose the first metallic layer is selected from the group consisting of aluminum and a material predominantly composed of aluminum [Col. 3, line 56].

With regard to claims 30 and 42, Zhang and Tabara disclose the second metallic layer is selected from the group consisting of titanium and a material predominantly composed of titanium [Col. 4, line 58 – Col. 5, line 10].

With regard to claims 31 and 43, Zhang and Tabara disclose the organic material is selected from the group consisting of polyimide and acrylics [Col. 4, lines 55-58].

2. Claims 1-12, 19-24, 32-39 and 44-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (PN 5,777,701, of record) in view of Tabara (PN 5,767,015, of record) and further in view of Fukunaga (PN 6,115,094, of record).

With regard to claims 1, 7, 19 and 34, Zhang and Tabara disclose the invention substantially as claimed including the semiconductor device as recited in the rejection above. Zhang and Tabara further disclose the first insulating layer is silicon oxide. Zhang and Tabara do not disclose the first insulating layer comprising an organic material. However, Fukunaga discloses a first insulating layer comprising material selected from a group consisting of a silicon oxide and an organic material. Note Col. 4, lines 55-56 and Figures 2D, 4C and 5 of Fukunaga. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute silicon oxide of Zhang and Tabara with organic material, such as taught by Fukunaga because silicon oxide and organic material are commonly used as the interlayer insulating layer and they are interchangeable.

With regard to claims 2, 8, 20, and 35, Zhang, Tabara and Fukunaga disclose the first metallic layer is selected from the group consisting of aluminum and a material predominantly composed of aluminum [Col. 3, line 56].

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With regard to claims 3, 9, 21, and 36, Zhang, Tabara and Fukunaga disclose the second metallic layer is selected from the group consisting of titanium and a material predominantly composed of titanium [Col. 4, line 58 – Col. 5, line 10].

With regard to claims 4, 10, 22 and 37, Zhang, Tabara and Fukunaga disclose the organic material is selected from the group consisting of polyimide and acrylics [Col. 4, lines 55-58].

With regard to claims 5, 11, 23, 32, 38, and 44, Zhang, Tabara and Fukunaga disclose wherein the semiconductor device is selected from the group consisting of an active matrix liquid-crystal display device, an active matrix EL display device, and an active matrix EC display device.

With regard to claims 6, 12, 24, 33, 39, and 45, Zhang, Tabara and Fukunaga disclose the semiconductor device is selected from the group consisting of a video camera, a digital camera, a projector, a goggle-type display device, a car navigation device, a personal computer, and a portable information terminal.

### ***Response to Arguments***

3. Applicant's arguments filed 03/01/04 have been fully considered but they are not persuasive.

It is argued, at page 12 of the Remarks, that Zhang and Tabara do not disclose a second insulating film formed on the second wiring, the first wiring and the first insulating film. This argument is not convincing because the combination of Zhang and Tabara references discloses

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the second insulating film formed on the second conductive layer, the first conductive layer and the first insulating film. Note that the word "on" does not necessary mean "in direct contact with" or "in physical contact with". Therefore, Applicants' claims 28 and 40 do not distinguish over the Zhang and Tabara references.

It is argued, at page 13 of the Remarks, that Zhang, Tabara and Fukunaga do not disclose a second insulating film formed on the second wiring, the first wiring and the first insulating film. This argument is not convincing because the combination of Zhang, Tabara and Fukunaga references discloses the second insulating film formed on the second conductive layer, the first conductive layer and the first insulating film. Note that the word "on" does not necessary mean "in direct contact with" or "in physical contact with". Therefore, Applicants' claims 1, 7, 19 and 34 do not distinguish over the Zhang, Tabara and Fukunaga references.

### ***Conclusion***

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

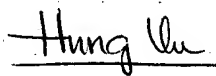
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung K. Vu whose telephone number is (571) 272-1666. The examiner can normally be reached on Mon-Thurs 6:00-3:30, alternate Friday 7:00-3:30, Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (571) 272-1732. The Central Fax Number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Vu

May 4, 2004



Hung Vu

Patent Examiner